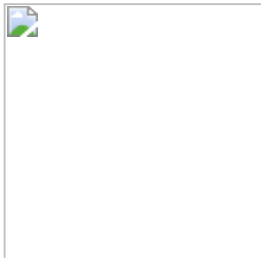


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东昆仑夏日哈木镁铁质-超镁铁质岩体岩石成因与拉张型岛弧背景

作者	单位
姜常义	长安大学地球科学与资源学院, 西安 710054 西部矿产资源与地质工程教育部重点实验室, 西安 710054
凌锦兰	长安大学地球科学与资源学院, 西安 710054
周伟	长安大学地球科学与资源学院, 西安 710054
杜玮	长安大学地球科学与资源学院, 西安 710054
王子玺	长安大学地球科学与资源学院, 西安 710054
范亚洲	长安大学地球科学与资源学院, 西安 710054
宋艳芳	长安大学地球科学与资源学院, 西安 710054
宋忠宝	中国地质调查局西安地质调查中心, 西安 710054

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摘要:

赋存超大型镍矿床的夏日哈木 I 号岩体位于东昆仑造山带西段之东昆中早古生代岛弧带。锆石 U-Pb 年龄为 439Ma, 由分属橄榄岩相、辉石岩相、辉长-苏长岩相的多种岩石类型组成。堆晶结构与堆晶层理发育, 属岩床状层状岩体。不平衡结晶作用在岩浆演化过程中居于主导地位。矿物结晶顺序为尖晶石/橄榄石→斜方辉石→单斜辉石→单斜辉石+斜长石→褐色普通角闪石, 各种岩石均富集轻稀土元素和大离子亲石元素, 亏损 Nb、Ta、Ti、P, 显示了岛弧环境岩浆岩的地球化学特征。Nd、Sr 同位素组成均属富集型地幔范畴和 EM II 型趋势。矿区内的 III 号与 IV 号岩体属蛇绿岩套, 证明在昆中岛弧带内部存在岩石圈破裂带。区域构造格局与演化历史以及区域地球物理场的研究表明, 东昆中岛弧带属拉张型岛弧带。据此, 可以认定拉张型岛弧环境是全球范围内第五种有利于形成镍矿床的构造环境, 中古生代是我国第三个镍矿主成矿期。

英文摘要:

The Xiarihamu No. I intrusion which bears super-large nickel deposit located in Early Paleozoic island arc zone in the middle part of the western section of the eastern Kunlun orogenic belt. The weighted average $^{206}\text{Pb}/^{238}\text{U}$ age is 439Ma, which can be considered as the crystallization age of the intrusion. The intrusion is mainly composed of peridotite, pyroxenite and gabbro-norite with pervasive cumulate texture and cumulate stratification, suggesting a sill-like layered intrusion. Magma evolution processes are mainly controlled by disequilibrium fractional crystallization. The crystallization sequence of minerals is spinel/olivine→orthopyroxene→clinopyroxene→clinopyroxene+plagioclase→brown colored hornblende. Rocks from the intrusion are enriched in light rare earth elements (LREE) and large ion lithophile elements (LILE) and depleted in Nb, Ta, Ti and P, consistent with the geochemical features of rocks from island arc environment. Nd-Sr isotopic compositions suggest an enriched mantle origin with an EM II. Xiarihamu No. III and No. I intrusions belong to the ophiolite suite, suggesting a lithospheric fracture zone in the island arc belt in middle part of the eastern Kunlun. Regional tectonic evolution history and geophysical field suggested that middle part of eastern Kunlun orogenic belt was an extensional island-arc belt. Therefore, we conclude that extensional island arc environment is the fifth favorable tectonic setting for the formation of nickel deposits in the world and Middle Paleozoic is the third important period for the formation of nickel deposits in China.

关键词: 夏日哈木层状岩体 岩浆演化 岩浆源区 拉张型岛弧 岩石圈破裂带 东昆仑

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